



CQ-TV, journal of the British Amateur Television Club.

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This edition of CQ-TV carries the New Members list omitted from the last edition, as well as the 'What the Other Chap is Doing' feature, also omitted from the last edition because of lack of space. As these two items take up several pages, and also as it was felt that it would be unfortunate to split the pulse and waveform generating article by Mike Cox this edition has been given an extra four pages. Apart from the regular features the whole of this edition is given over to the transistorised units described and built by Mike Cox. The next edition will carry another transistorised unit - the start of a transistor camera channel in the shape of the camera control unit; the video processing amplifier. All the units described in this edition will be on show at the Convention in September.

Unfortunately the information about camera tubes and yokes given in the last edition was not quite correct. ALL camera tube enquiries are being handled by Don Reid, and enquiries and orders for Vidicon yokes should be addressed to John Tanner.

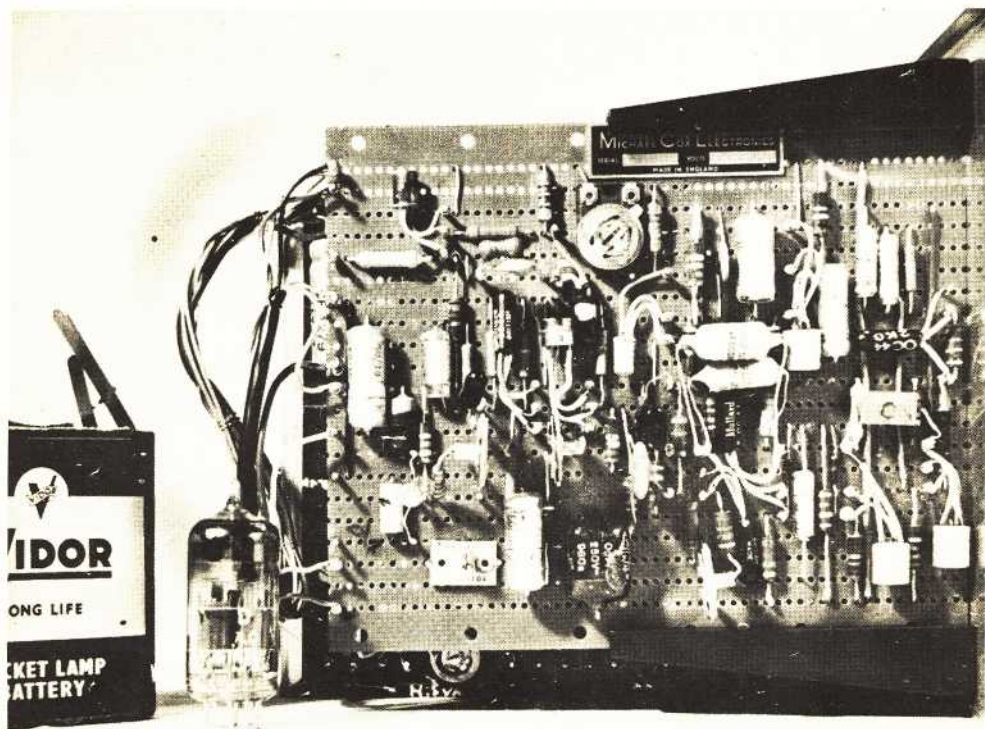
The 7 Valve camera article by D. Goodyear in CQ-TV 47 has one or two small corrections to the circuit diagram. As this edition is being rushed to the printers to have it out by the Convention these corrections will not be available in time. The full details may be obtained from John Tanner, and will be published in CQ-TV 49. In the meantime note that the secondary of the line scan output circuit should show one side of the transformer secondary taken to chassis, the pulse take off AND the damping circuit taken from the other. These errors occurred during the preparation of the article and were not present in the original - the editors apologies to any members inconvenienced by these errors. Please drop a card to me if you are building this camera.

John Tanner, G3NDT/T

Remember - B.A.T.C. Convention, September 8th.  
Conway Hall, Red Lion Square, W.C.1.

Front Cover photograph shows the waveform output from the Grating Generator described in this edition. The waveform is displayed on Mike Cox's home made 3" Oscilloscope.

photo: Geoffrey Tye.



Sawtooth generator and grating generator board.

note the use of insulating board with components one side and wiring the other. The E88CC and the battery show the size.

#### BOOK REVIEW

"Pulse and Digital Circuits", by Millman and Traub; published by McGraw-Hill, 687 pages, \$14.00.

This is an excellent book covering every type of pulse circuit used in TV. Although it is not specifically aiming to cover TV circuits alone, there is a chapter on TV requirements which, together with the fact that this a recent book (1956) makes it to my mind a better bet than our old standby Fink. In particular this is the first book I have seen where the development of the all-binary counter and shaper units are dealt with sufficiently clearly for the amateur to design his own. Some of the other subjects

covered are: multivibrators, cathode followers, clamp circuits, clippers, counters, timebases and gate circuitry. These are all covered in sufficient detail so that the operation is easily understood, and BATC members will have no difficulty in adapting the designs to their own requirements. There is a good list of references, and no less than 54 pages of surprisingly practical problems. This is a large book in the best McGraw-Hill traditions; unfortunately so is the price, but UK readers at least will be able to borrow the book from the Public Library. Very highly recommended.

M.B



# A TRANSISTORISED PULSE & WAVEFORM

## GENERATOR

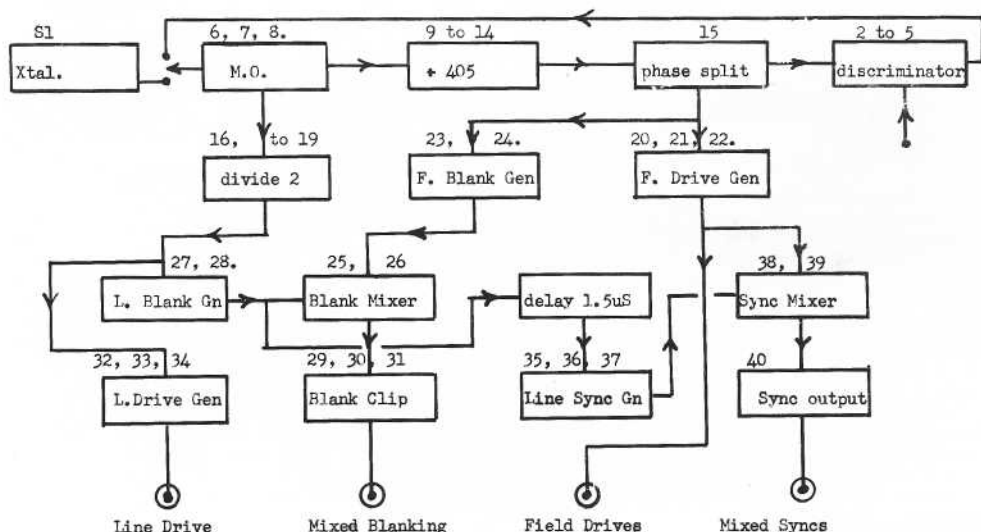
by M.H. Cox.

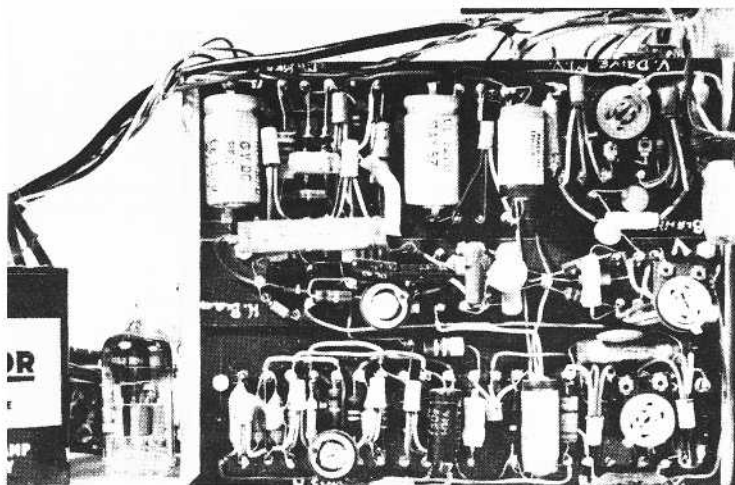
Before going into the circuit details it would be as well to mention the technical specification of the generator. It gives outputs of Mixed Blanking, Mixed synchronising, Line drive and Field drive pulses of 1 volt (or more) into 75 ohms, and both syncs and blanking have a 75 ohm sending impedance. The system used is the British 405 line with one broad pulse of 40  $\mu$ s in the vertical interval instead of eight. The generator may be locked to mains frequency or to an internal crystal of 10 times line frequency. (crystals for 101.25 Kc/s are about five times cheaper than crystals for 20.25 Kc/s) The power supply requirements are a centre tapped 9 volt supply at about 150 mA, and may conveniently be obtained from two 4.5 volt bell batteries.

The generator is built mainly round the transistor White multivibrator -1,2,below- which is an extremely stable circuit, and one which performs very readily. It is of the astable type, although a monostable variant of the circuit is used -3, below- in the generator. The astable circuit synchronises readily and further has the property of varying its frequency with the voltage on the free base. Hence its use for the Master Oscillator, S6 & S7. By returning the free base via R5 (22K) and the four diode bridge S2 to S5 to the

slider of RV1, and by injecting a 50 c/s signal of about 1 volt r.m.s. through a capacitor (not shown) to the slider of RV1, the error voltage derived from the bridge, which is keyed by field frequency pulses from the final divider (S13, 14, 15) pulls the Master Oscillator to the correct twice line frequency. Alternatively the crystal oscillator S1 synchronises the M.O. which is set to divide by 5. An emitter follower, S8, is used to buffer the M.O. from the first divider, and from the bistable or divide by two circuit. The three dividers are very similar to the M.O. in circuit, the timing capacitor connected between the emitters - larger capacitors for the lower frequencies; small electrolytics are used for the largest capacitors with no apparent difficulty.

The timer unit, described briefly above, is built on a Paxolin board 6" x 5" using Harwin H2081 or H 2087 pins for connections. The transistors used are all 'White spot' types, but OC44/45 work equally well. The diodes in the bridge circuit and the bistable trigger steering circuit can all be CV448/OA86/GEX34 type.

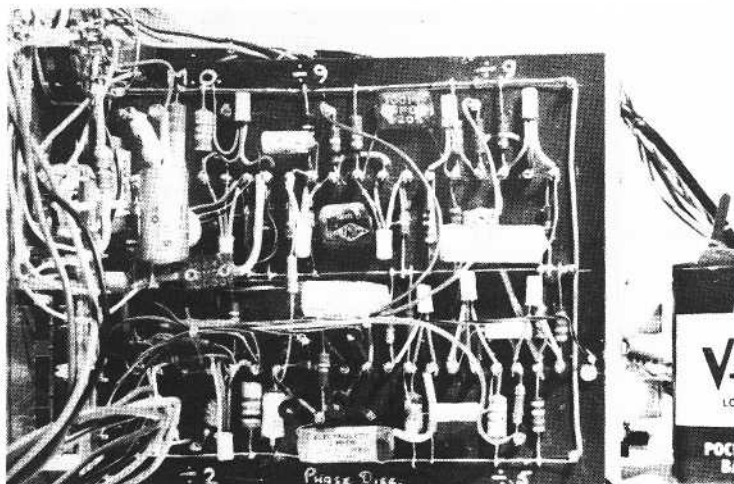




Waveform generation board.

Setting up the timer is made easier by using a double beam or differential oscilloscope, but it can be done by connecting the 'earthy' lead of the scope to the higher test point. Briefly then - connect Y1 if double beam or differential or Y live to the M.O. T.P.2. - connect Y2 or 'earthy' to T.P.1., Xtal Osc test point. Set RV1 until M.O. locks on one fifth of crystal frequency. Practice soon shows this. Move the leads down a test point - Y1 to T.P.3, Y2 to T.P.2.

and adjust RV2 for division by nine, then down one more and adjust RV3 for division by nine. RV4 is similarly adjusted for a division by five. It is much easier to set up in this way if the scope is triggered from the lower frequency of the two being compared. As a final check, connect Y1 to TP6, Y2 to TP2 and check the divide by two circuit.



Timer Board

The waveform generator uses more of these multi-vibrators and the circuits are very straightforward. Trigger pulses at line frequency are taken from TP6 on the timer unit to the line blanking M/V and the line drive M/V. These have the ratios of their emitter resistors arranged to give the correct mark space ratio for these pulses. Another trigger signal is taken from the collector of S27 in the line blanking M/V via a delay line of approx 1.5uS length, and 1K characteristic impedance to the line synchronising M/V S35, 36. This is a monostable M/V with the width controlled by RV5, and fires some 1.5 uS after blanking to give the front porch. The line drive M/V feeds S34, the output stage which is simply a grounded emitter stage using an OC42 or GT43. Because the output is a negative going pulse it would be better to use n-p-n transistors for all pulse outputs, but the rise times of the ones available (2N1304, Texas Instruments) were rather poor. Doubtless a transistor such as the Ferranti ZT23 would have been excellent, but it is rather expensive at 22/6.

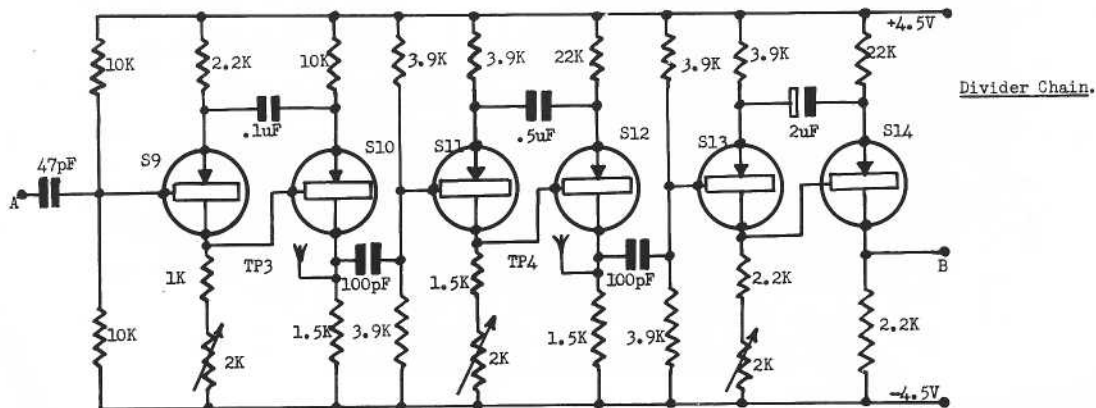
Field trigger pulses are taken from the emitter of S15, the discriminator bridge phase splitter. They synchronise S23-24, the field blanking M/V and S20-21 the field drive M/V which are straightforward circuits as used elsewhere. The line and field blanking waveforms are mixed in the diodes S25-26 (CV448, OA5, OA7 etc) and fed to the Schmidt trigger circuit S29-30-31. for cleaning up before feeding to the output. This circuit, similar to the bistable circuit used in the timer, is very similar to valve circuitry and no detailed explanation is given here - there are several descriptions of transistor design procedure in the literature.

The only remaining circuit is the generation of mixed synchronising signals. The output from the M/V S35-36 is taken to the switch S38, which has S39 connected in parallel with it. The operation of transistors without any forward bias, and with sufficient input base current to 'bottom' the transistor during the pulse is a very powerful technique, as the collector saturation or bottoming voltage of a transistor,  $V_{ce\ sat}$ , is typically 0.2 to

0.3 volt. Hence the output voltage is only fractionally less than the supply voltage. It is good practice to allow the transistor to only just bottom, otherwise hole storage effects will spoil the 'turn off' time. This explains the use of the resistor in the base of S38, and the capacitor in parallel with it. The resistor is determined by the base current required to 'bottom' the transistor, and hence by the beta, or current gain of the device. The capacitor is adjusted while observing the output waveform. The switch S39 is fed via C38 and R87 is fed via 100K and .01 with field drive, and the low value of the C & R differentiate the waveform, S39 clips it, and adds it to the line signal in S38 at the common resistor R86 common resistor 2.4K. Because the transistors bottom the result at this common resistor is a clean mixed synchronising waveform, which is then inverted in the output stage S40 which uses an AS221 transistor. Some adjustment of the field drive coupling RC circuit may be necessary to achieve the correct 40uS field sync. pulse.

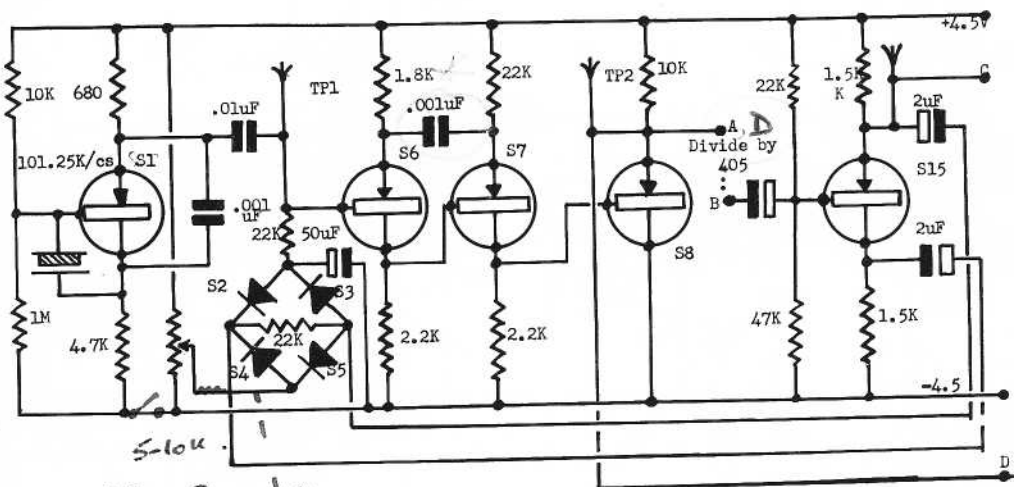
The shaper unit is also constructed on a paxolin board 6" x 5" using Harvin pins, but Veroboard VB 1006 would be suitable. The shaper & timer boards are joined by 'U' shaped end pieces which carry the output connectors. The delay line and crystal oscillator, S1, fit in between the two boards, and there is room for two 4.5 volt flat batteries as well!

The whole unit has proved remarkably stable and will work with batteries which have dropped to 7 volts on load (if the dividers are tweaked). Some members may have seen the unit in operation at last year's Radio Hobbies Exhibition operating the monochrome cap caption scanner. In a future issue it is hoped to give the modifications for 625/525 lines, and the modifications to the output stages for 2 volts of pulse, and the circuits of a pulse repeater which will enable two separate pulse feeds to be obtained from the generator.

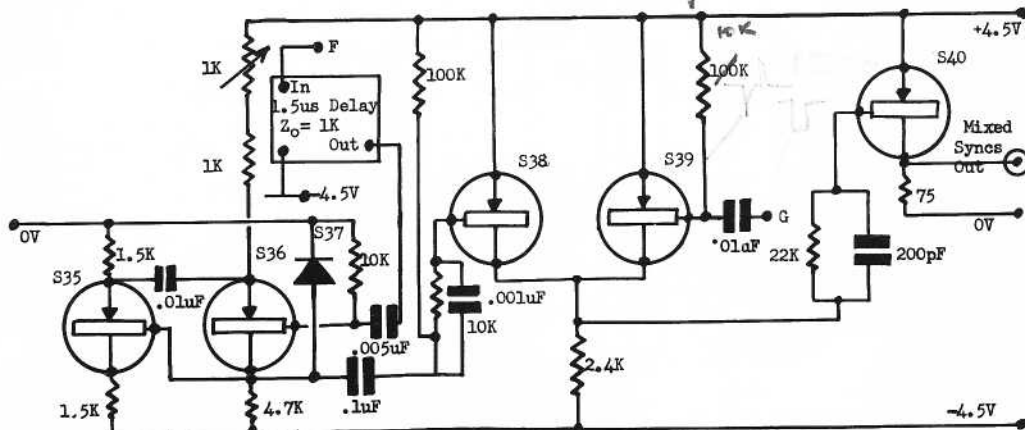


Xtal OscDiscriminatorM.O.Phase Split

.007



M.O. Freq.  $\frac{1}{2}$  No Lock In

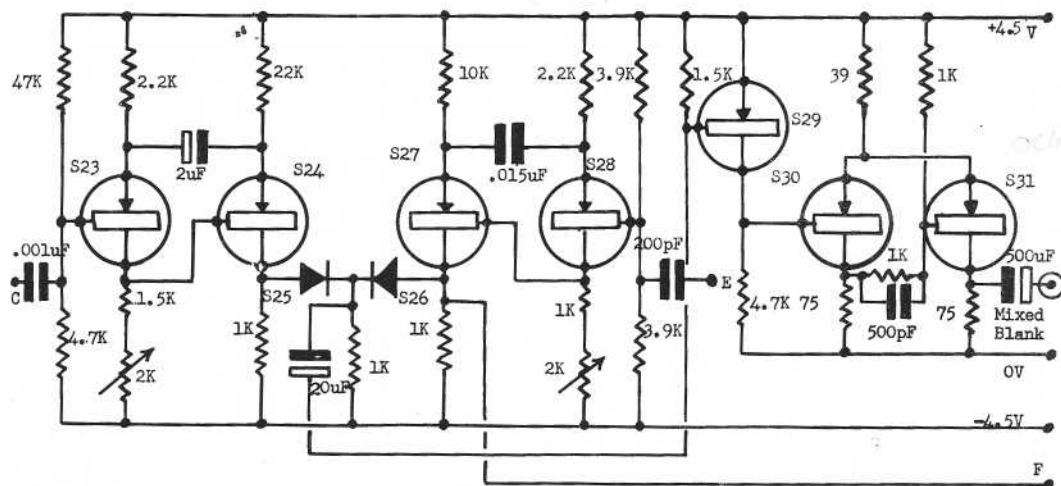
Sync M/VDelaySync MixerSync O/P

Field Blank

Blank Mix

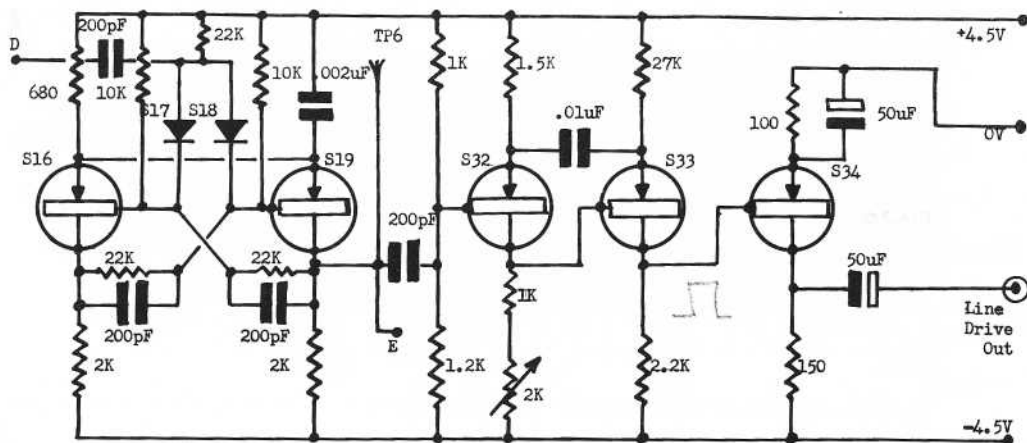
Line Blank

Blank Clip & O/P

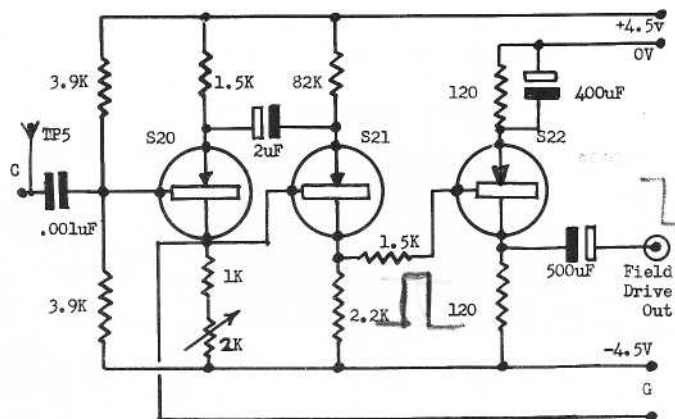


Divide by 2

Line Drive M/V and O/P





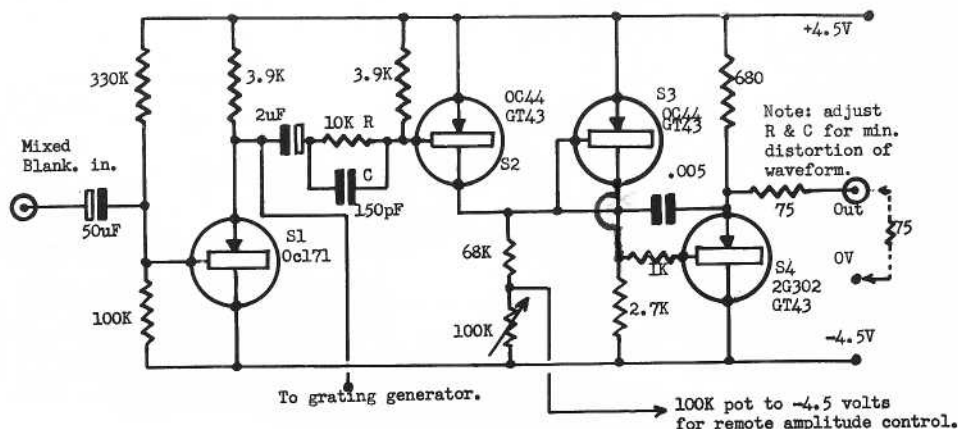


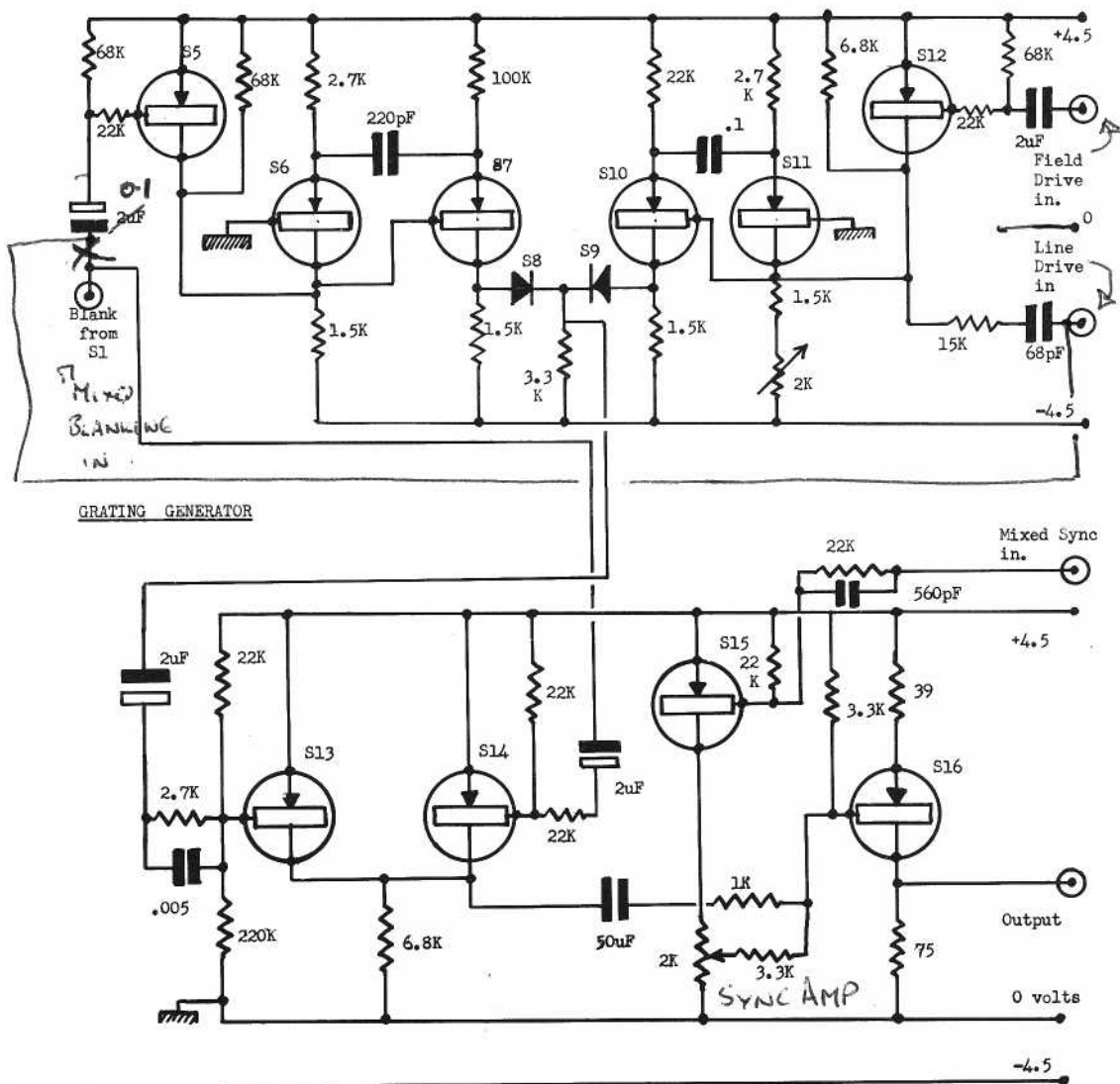
Since the 1961 Radio Hobbies Exhibition two further units have been designed and built to work with the generator; these are a sawtooth generator (for setting up transmitters etc) and a grating generator (for linearity checks and colour tube convergence etc). The sawtooth generator is a very simple unit to make, uses only four transistors and gives up to 1 volt output into 75 ohms from a nominal 75 ohm source. Total power taken in the region of 15mA !

### SAWTOOTH GENERATOR

The circuit consists of an emitter follower S1, which gives a high input impedance to bridge the generator blanking output. Blanking is taken from S1 via R & C to the base of S2. The coupling components form an attenuator for the blanking signal, to allow S2 to just bottom at the tip of the blanking waveform. The values given are for 1 volt blanking signals and a 'white spot' transistor for S2. R was 22K for 2 volt pulses. S3 and S4 form a Miller integrator with emitter follower output, with the .005, the 68K and the pot.

forming the time constant. Due to the low impedance of the emitter follower, made even lower by feedback, a 75 ohm resistor in series with the o/p gives a matched sending impedance. The output signal consists of a sawtooth correctly blanked so that it is only necessary to mix synchronising pulses with it to have a composite test waveform. The sawtooth is normally fed into a transistorised vision mixer, which is designed to accept a non-composite input and adds syncs at the output. The generator shares a common piece of Vero board VB1006 with the grating generator.





S8,9. 6A47, 6A5 etc.  
 S6,7,13. 6C170, 171  
 S16. 2N711 (Texas Inst)  
 All others 6C44

GRATING GENERATOR

The grating generator, circuit on page nine, is built on the same board as the sawtooth generator described on page 8. The generator uses two multivibrators of the type used in the sync. pulse generator, but these are gated by line & field pulses. The pulses are mixed, blanked, and have sync pulses added before the output stage which has 75 ohm o/p impedance.

Mixed blanking, negative going, is fed from the emitter follower S1 on the sawtooth generator to the gate transistor S5. During blanking time, the transistor conducts heavily and pulls the collector of S6 towards the positive rail. This stops the multivibrator during line & field blanking and ensures that the oscillator starts in the same phase every line, thus giving a stationary pattern. The M/V is set to run at around 200 Kc/s, with pulses about 0.25 to 0.5 microseconds long. This gives approximately 20 vertical bars on the monitor. If some adjustment is required, reduce the 1.5 K in the collector of S6 to 1K and add a 1 or 2K pot. in series. S10 and S11 constitute the horizontal bar M/V, and S12 the gating transistor which is fed with field drive. This ensures that the generator starts in the same phase at the beginning of each field, and so gives a stationary pattern, however, it does not ensure that the horizontal bars start in the same place along the line, and a rather ragged horizontal bar pattern results. If, however, a small amount of line information is fed into the device then the start and finish of the horizontal bar tends to be governed by line frequency information, and with the values shown, the horizontal bar is one line in duration.

The outputs of the two multivibrators are mixed in the diode gate S8, 9. and pass to the transistor S13. They appear negative going at the collector of S13, and blanking input to S14 causes the common collectors of S13, 14 to bottom and hence blanks the signal. A small forward bias is put on to S13 - too little will cause a large pedestal in the o/p. The blanked signal is taken via a 50 uF and 1K to the base of S16. Also to the base of S16, via the sync amplitude control circuit, is fed mixed sync information from the clipper and inverter S15. The output stage is a conventional common emitter stage with a gain of a half when the generator is terminated in 75 ohms. The original generator uses a 2N711 as the transistor but because of the large amount of feedback a transistor such as the 2C302 or 0C42 could be used with small degradation of the output risetimes.

The sawtooth and grating generator are assembled together with the S.P.G. and power supply in a case some 14½" x 6½" x 6½", made using Widney Dorlec 'Midget' range of corner extrusion. There is ample room in the case for further test waveform boards, and the extra circuits needed to convert the S.P.G. to 525/625 line operation.

WHAT THE OTHER CHAP IS DOING

compiled by D.S.Reid.

CAMBRIDGE NEWS Harry Lowe G3PEI/T, the Group Sec., has also become the Sec. of Cambridge & District Amateur Radio Club. Ian Waters, G3KKD/T, brought his gear over one evening and some pictures of the usual high standard were received from G3NOX/T and also from G3PDO/T. A few days earlier, Ian gave a demonstration at March, Cambs., and video signals were received from two stations at the same time, using two monitors to view them. This sounds like a BATC "first"; has anyone else picked up and displayed two different amateur TV signals simultaneously? Bill Thacker G3PGF/T has a 30' tower and is busy assembling it in his garden. Sid Robinson G3PDO/T has sent signals to G3PGF/T and to G3NOX/T, and PDO/T and PGF/T have also both received pictures from NOX/T. Here is a useful tip for silver plating small pieces of equipment, from PEI/T: if you take some used hypo which has had a lot of films or papers fixed in it, and rub it on brass with a piece of rag, the brass becomes silver plated. The secret is in the rubbing - if you just dip the brass in, it will take a plating of silver which won't stick.

HIGH WYCOMBE NEWS Rex Lakeman and Ken Cooper report that the Group is making good progress with the 625 line camera. Bill North has a FSS in action, and intends to build a camera next.

S.W. ESSEX TV GROUP NEWS Many thanks to Martin Lilley for news of this TV Group. Jim Brett, G3MJZ/T, has rebuilt the 3" image orthicon camera previously owned by G3KOK/T, and has fitted a lens turret which will be motorised in due course. His transistor SPG is almost finished, and he is also working on a transistor vidicon camera. In addition, he is busy on a telecine unit, with continuous film transit (is anyone else working on telecine gear these days?) Fred Northwood is modifying his 525 line SPG to 405 line, incorporating mains locking. Alan Glozier G3CRR has built a 405 line SPG, and is constructing a FSS in unit form. John Vanhoogstratten has a 3" image orthicon camera chain. Finally, Martin Lilley has a studio set-up in his front room at home consisting of a 4.5" image orthicon with motorised/manual lens turret; the camera is mounted on a Vinten adjustable height friction head and dolly and a position control servo is being built to provide remote focusing. Martin has a 7' rack containing much useful video gear including an effects generator and effects matting amplifier. Cues are provided at +250 volts D.C.

John Lawrence GW3JGA/T of Prestatyn gave a demonstration of colour TV recently: he was able to produce a test pattern and caption, viewed by an MW6-2 projection tube running at 25KV, looked at through a rotating 6 section 3 colour disc. John reports good results except for the reds which are somewhat tomato in colour, but the picture is bright and flicker not very noticeable. The colour disc locks very well; the next move is to try to obtain a projected colour picture. We look forward to more news of this fine effort.

Can't find any more colour news this time ; John Ware has been in hospital with a slipped subcarrier or desaturated primaries (or something). All best wishes for a speedy return to good health.

A.N.Venkataraman VU2TD of Bangalore, India, is building a 625 line SPG. He reports that 5FP7 and 7FP7 tubes are readily available in the surplus market, and he is using a 931A and 5FP7 in a FSS. VU2TD passes on a reference to "Electronics", July 1954, which describes the use of a slide projector as the optics of a FSS. Stan Pollitt, Lincs., is also building a FSS and was lucky in picking up a 931A cheaply at a local dealer's. Sgt. Hiles, Singapore reports that his FSS mentioned in CQ-TV 46 has been successfully completed ; a 14" industrial TV monitor provided the syncs. Tony Aldridge, G3PJ4, is about half way through his FSS construction. John Cull, Ashton-under-Lyne, Lincs, has been busy on FSS gear, the latest system being an improved version of two earlier systems which he had tried. Tom Rudderham, Long Ditton, Surrey, has a FSS now in the explosive stage ; he says it is unfit for human consumption yet ! Good luck with it, OM. He is anxious to find a Group in the Kingston, Surbiton area - we have quite a few members around there, so how about it, men ? Clive Cohen, Sutton Coldfield, has built a FSS using 931A, E88CC, 6CH6 and a 12BH7 in the video chain.

It seems time for a new paragraph, but there is yet more FSS news. Warren Heaton, VK4GT, Queensland, has commenced construction of his FSS and intends to use a 14" TV set as monitor. His 931A was purchased from the Club (sorry, we have none left, but we keep our eyes open !). C.W. Brook, Chippenham, is building the ever-popular Bill Still scanner. R.C. Shuck, G3NXX, Kidderminster, completed all the metal bashing for his FSS within three days of joining the Club ! He is also using the Bill Still circuit. C. Cheney, Weybridge, has bought a 5FP7 and a 3FP7 for his FSS ; he is designing a regulated power supply for the video amp. Mike Donaghue, Chingford, Essex, has completed his Bill Still scanner. Just in case I have confused any newcomers to our hobby - FSS is "flying spot scanner".

Many thanks to Ben Sedlack, Albuquerque, for drawing our attention to a useful article on a vidicon camera : "TV Camera You Can Build" by W.E.Parker, in the May 1962 issue of Radio-Electronics. The complete camera requires only 6 valves in addition to the vidicon ; it requires only a mains input, and provides a modulated RF output. The June issue is to contain coil winding details. Jeremy Clegg, Fleetwood, recommends "Industrial TV" by H.A. McGhee (Newnes, 15/-) as a good book for information on camera tubes, as well as some vidicon circuits. I have just realised that W.E.Parker (W8DMR) is one of our members ! Good work, OM. Another article by a member describes a vidicon camera design, in French : "Réalisation d'un équipement

amateur deprises de vues TV - à la portée de tous" by R. Monteil, F8UM in Television, No. 116, Sept. 1961, p. 197.

Simon Freeman, G3LQR/T, Dedham, Essex mentions that he and Jeremy Royle, G3NOX/T, are always ready to receive pictures. Simon has a 64 element stack ; his pre-amplifier employs an A2521. Eddie Barrall G2BCB, Colchester has erected a new aerial array - stacked skeleton slots with directors and reflectors. This has made a vast improvement, and G3LQR/T comes in very strongly. Eddie hopes to be exchanging pictures with LQR/T and possibly with NOX/T in the summer ; he is having fun with PNP transistors these days, and has produced a divider chain using OC44s and OA10s.

Dave Quigley, G3PRI/T, Cowes, will be in action on 70 cm, at about 10 watts, later this year ; he would like to hear from anyone in the area: Isle of Wight, Southampton and Portsmouth, with a view to forming a TV group. His Bill Still scanner is working perfectly, and he worked with it for a long period on closed circuit. John Simkins and G3OVW, at Sheffield University, are forming an amateur radio & TV Club there. All best wishes for its success. James Poye, ZS5JF, sends his kind regards from Durban ; amateur TV activity is very low at present. Fred Constable has been posted up to Troon, Ayrshire, and is taking the opportunity to have some thoughts on colour TV.

Frank Marshall, VE4CX/TV, sent a most interesting letter from Winnipeg. His TV interest goes back to 1934, although his first constructional effort was a receiver in 1949. This was followed by a FSS in 1952 and a 5527 iconoscope in 1953. Amateur TV transmission was permitted in 1954, and in April 1954, VE4CX was duly endorsed for "compatible video on amateur frequencies above 420 Mc/s". He built a cathode follower plate modulated 832 ; this preceded the first commercial station by a week. He has an image orthicon and a vidicon, and plans are afoot to build cameras around these tubes ; other activity includes a mobile SSB rig, and the installation of vibrato in his Hammond organ. Another SSB man is Stan Widgery VK3SE, Ballarat East, who works around 14320 Kc/s. Stan's vidicon camera is now working, a standard TV receiver forming the monitor. Peter Sharp, G3NNH/T, of Feltham, has bought a secondhand car, and work on the vidicon has temporarily stopped. Shame.

D. Goodyear, St. Albans, is very pleased with his vidicon camera which was in action, completely unattended, at a local exhibition for 10 days. His next step is likely to be an image orthicon camera. Malcolm Burrell, Ilford, is still at school at present, and would be grateful for any surplus gear discarded by members. Bert Love of Birmingham has defined the genus of gremlin which always attends amateur exhibitions in order to disconnect mains and co-axial plugs - "gremlus amatorus" is the exact species ! B.A. Robinson, Toronto, has his G3CVO-type counter in working action, and is completing his SPG. Craig Sprason of Chester is interested in long distance TV reception, and would like to get in touch with any other members having a similar interest.

Roy Smalley, G3LJO/T has been attempting TV transmission over a 5 mile path to Fleetwood where there are two 70 cm receivers - but no success so far. G3LJO/T is equipped for transmission and reception on 70 cm ( 432.16 Mc/s ) and also 25 cm, 13 cm and 3 cm. Pete Johnson is now working in Dublin ; he has a useful 4TH 2935 ft above sea level.

And the very next letter in my file is from Jack MacIver, VK4JE, of Brisbane, who hopes to visit Britain in the summer of 1962. Another visitor will be Mike Smuts from Southern Rhodesia - he is attending the IEE TV Convention. Bob Mangold, K3BWW, Pittsburgh, is busy working for his Ph.D., so progress on the new image orthicon camera has been slow. His new SPG is complete ; it contains 22 valves and does a better job than his old 65 valve SPG, as it meets the professional standards in USA and Canada. A fully transistorized power supply for the new camera chain is the next item to be built.

John Jull, G3MHZ/T, is going great guns up in Manchester ; he is now a keen transistor man so that all his video and pulse gear is being transistorised - a useful feature is the saving in space. His transmitter line-up is EL85, EL85, 5763, 2 x 5763, 4QV06/40, 4QV06/40. James Adams, G3PEH/T, of Hastings, is constructing a 70 cm transmitter. A.S. Glazier, G3PEG/T, Poole, is building an A2521 front end for 70 cm. In his transmitter, a 4QV03-20A tripler from 144 Mc/s is employed ; it has proved quite successful with 12 watts input. A 6-40A stage is planned, as a future development. A welcome letter has arrived from Bruno Puglia, W1ETP ; he is hoping to form a local TV group in West Haven, Conn.

C.G. Ager, Catford, S.E.6, has completed a waveform generator and monoscope, and achieves 2.5 Mc/s resolution on Test Card C. He is modifying a 625 line monitor to 405 line at present. Gordon Sharpley, G3LEE, Manchester, has a transistor SPG in operation, and is thinking about a transistor CCU. J. Harte, Co. Limerick, is winding his own scan and focus coils for his vidicon ; Deryck Aldridge of Newcastle is also building a vidicon camera. Besides amateur TV, Deryck is also interested in radio control. He has built a radio controlled boat, operating in the 27 Mc/s band ; the control signals are generated by a transistor multivibrator, and the receiver line up is RF mixer + 2 IFs with diode detector and a 3 transistor output stage. There was a write-up on his model radio-controlled car in the Sept. 1961 issue of Practical Mechanics.

Stu Cohen, K2IOC, Utopia, N.Y., knows Greg Ehrler, K2ALX, who lives about 5 miles away. K2IOC has completed a 6326 vidicon camera, and is now constructing a CCU for it ; this will incorporate aperture correction, peak white clippers and an automatic target control. He has erected a 16 element Yagi for 440 Mc/s. At the other end of the proposed link, Greg has a vidicon and an orthicon camera, and runs a 4X-250B into four skeleton slot antennas.

Michael Bues, G3OPB/T, Epsom Downs, has been working on 23 cm with a 2C39A tripler. He recommends the use of a helical aerial, and passes on a reference to it : "Sidefire Helix UHF-TV Transmitting Antenna" by Krause in Electronics, August 1951, p. 107. It does require a 130Q match, however.

John Williams, Dublin, has been modifying a vidicon camera from 625 to 405 line standards, and will turn it into a switchable standards system. For a zoom lens costing about £12, he suggests a Japanese 8mm supplementary lens with separate viewfinder, used in conjunction with a 1" 16 mm lens. W.A. Smith, Camforth, has converted a Murphy TPG 11 pattern generator so that it can be used with his new camera ; he recommends these units, which can be obtained nowadays from about £20. Eric Lewis, G3OCG, St. Helens, has been able to assist J.C. Tournant of Plymouth to cure a fault in his Telequipment pattern generator - the diodes in the mains lock phase comparator were changed to EB91, and the mains lock difficulty disappeared.

Ron Geere, London, is pressing on with his 64 line slow scan system, and is building a transistor timing unit and blanking generator for this standard. D.A. Saxony, Co. Wicklow, has his vidicon in action, using sequential scanning ; he plans to convert to 405 lines interlaced in the near future. Linearity is a snag at the moment. John Tanner G3NDT/T and Dave Jones G3LYF/T are working on an exchange building scheme ; John is building a vidicon camera for Dave, and Dave is doing some "polishing up" of John's 4X150 transmitter. So far, Dave has obtained 20 watts of drive at 70 cm, but has yet to achieve more than a couple of watts from the 4X150. He is not satisfied with his BATC pulse generator, and intends to settle down with a scope, a soldering iron, and a copy of Farley's "Pulse Circuits".

Finally, some stop press news from Warren Jacobs, VK6WJ, Mount Yokine. He mentions that the PMG is withdrawing the 288 Mc/s band, and issuing 432 Mc/s instead, but the mains news is that Warren is building a video tape recorder (using standard width tape), scanning the tape at an angle along its length, as in the Japanese and American one head recorders. Head to tape speed will be 300"/sec with a track width of 50 thou. A 4 pole synchronous motor driving the shaft holding the record/playback head and slippings will be driven from a 100 c/s 50W PA to give the speed of 3000 RPM. This will give one field scan across the tape ; the track length is about 8" when the helix is opened out. Video will frequency modulate an RF multivib., then into the head. The head is home made, with a low impedance winding which should resonate at about 6 Mc/s ; the main snag which is anticipated lies in keeping the gap width as small as required. VK6WJ would be very interested to hear from anyone who is constructing a video tape recorder - meanwhile, the best of luck in this ambitious project.



**BIRMINGHAM NEWS** Brian Smith G3LGJ has been at work on his vidicon camera ; using a vidicon loaned by Ernie Foulds G3MXW/T, he obtained his first pictures before Xmas. The viewfinder employs a 6" GEC tube ; camera field coils are in series with the viewfinder field coils ; camera line coils are connected to the viewfinder line coils via a linearity network. These arrangements are based on George Flanner's ideas, and Brian reports that he achieves good linearity. G3MXW/T is progressing with his transistor SPG, and has transmitted syncs to G3LGJ. G2CIK/T is able to receive excellent pictures from G3LGJ or G3MXW - 3 miles away.

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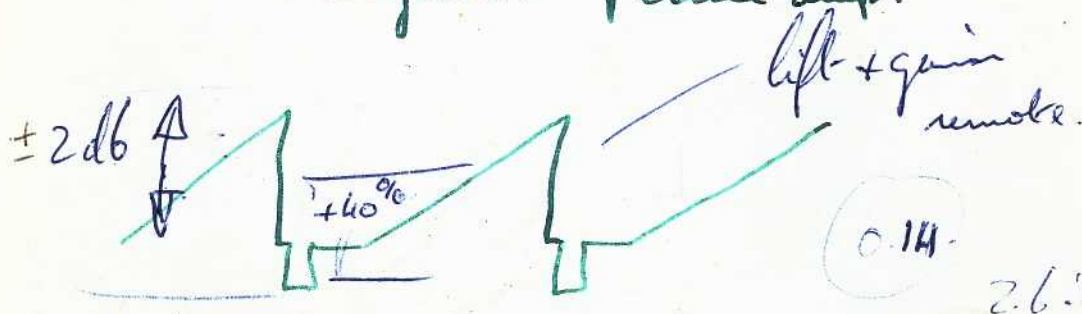
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